



Permit Evaluation Report
Oregon Department of Environmental Quality
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Proposed permit

DEQ proposes to renew the 1400A and 1400B Water Pollution Control Facilities (WPCF) general permits for food processor's wastewater reuse and disposal systems.

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Permit category: 1400A and 1400B WPCF General Permit

Activities requiring registration under this permit

A person is required to obtain coverage under a wastewater reuse and disposal permit to construct, install, or operate a wastewater reuse and/or disposal system [ORS 468B.050].

The 1400A permit authorizes the reuse for irrigation water of process wastewater that originates from wineries, seasonal fresh pack operations, food processors and operators washing fruits, vegetables or nuts that do not alter the original state of the product by cooking, pickling, slaughtering, or other mechanical, chemical, or thermal processes that produce up to 82,000 gallons per day of process wastewater.

The 1400B permit authorizes the reuse for irrigation water and/or disposal of process wastewater that originates from wineries, seasonal fresh pack operations, food processors and other operators washing fruit, vegetables, and nuts that alter the original state of the product by cooking, pickling, slaughtering, or other mechanical, chemical, or thermal processes that produce up to 82,000 gallons per day of process wastewater.

Activities not requiring registration under these permits

The following activities do not require registration under these permits

- The authorized discharge of process wastewater to a DEQ permitted municipal sewerage system through an industrial pre-treatment program.
- The reuse of process wastewater for activities inside a structure such as floor washing, toilet and urinal flushing, or other indoor purposes when allowed under the Oregon Plumbing Specialty Code and the resulting process wastewater is discharged to an approved sewerage system or onsite wastewater treatment system approved under OAR 340-071
- De minimis activities
 - Mobile custom slaughtering establishment as defined in OAR 603-28-0600
 - Small facilities that generate less than 100 gallons per day of process wastewater
 - Wineries that produce less than 4,000 cases of wine per year
- Process wastewater discharges authorized under another permit

Source location: Statewide

Coverage and eligibility

These permits are general permits that are issued in accordance with OAR 340-045-0033 where activities involve similar types of operations, similar types of wastes, and similar monitoring conditions.

Any person with an existing or proposed process wastewater reuse or disposal system that meets the following criteria is required to register under one of these permits.

1400A General WPCF Permit:

Wineries, seasonal fresh pack operation, marijuana producers, food processors and other operators washing fruits, vegetables or nuts that do not alter the original state of the product by cooking, pickling, slaughtering, or other mechanical, chemical, or thermal processes and meet the following conditions;

- Total process wastewater flow does not exceed 82,000 gallons per day; and
- Process wastewater is discharged to an evaporation pond or beneficially applied to land;
- The process wastewater reuse/discharge system must not be located in an area covered by a geographic general permit.

1400B General WPCF Permit:

Wineries, seasonal fresh pack operation, marijuana producers, fruit and nut or other food processors that alter the original state of the product by cooking, pickling, slaughtering, or other mechanical, chemical, or thermal processes that meet the following conditions;

- Total process wastewater flow does not exceed 82,000 gallons per day; and
- Process wastewater is discharged to an evaporation pond, subsurface leach field or beneficially applied to land;
- The process wastewater reuse/discharge system must not be located in an area covered by a geographic general permit.

Any person not wishing to be covered under a general permit may apply for coverage under an individual WPCF permit.

Table of Contents

Table of Contents	3
1.0 Introduction	4
2.0 Permit History	4
2.1 Issuance, Renewal and Modifications.....	4
3.0 Permit Discussion	4
3.1 Permit Coverage.....	4
3.2 Evaporative pond.....	5
3.3 Permitted process wastewater discharge volume	5
3.4 De minimis Activities.....	5
3.5 Application Instructions.	6
3.6 Definitions.....	7
3.7 Oregon Water Resources – Water Reuse	7
3.8 Schedule A Permit limits.....	7
3.8.1 Hauled Waste Limitations.....	7
3.8.2 Process Wastewater Limitations	8
3.9 Land Application Limitations	9
3.9.1 No Discharge to Waters of the State.....	9
3.9.2 Prohibition of Groundwater Degradation	9
3.9.3 Process Wastewater Irrigation Management	10
3.10 Schedule B – Minimum Monitoring and Reporting Requirements	15
3.10.1 Process Wastewater Monitoring and Reporting	15
3.10.2 Monitoring Reduction (for 1400B permits only).....	15
3.10.3 Additional Monitoring (for 1400B permits only).....	16
3.11 Schedule C, Compliance Schedules and Conditions	16
3.12 Schedule D - Special Conditions	16
3.12.2 Subsurface Drainfield	17
3.12.3 Irrigation Site Evaluation.....	17
3.12.4 Revocation	17
3.12.5 Reference Sources.....	17
3.13 Schedule F - WPCF General Conditions	18
4.0 Next Steps	18
4.1 Public Comment Period	18
4.2 Response to Comments	18
4.3 Modifications to Permit Evaluation Report and Fact Sheet.....	18
4.4 Issuance	18
5.0 References	18

1.0 Introduction

The Oregon Department of Environmental Quality (DEQ) proposes to renew the Water Pollution Control Facilities (WPCF) 1400A and 1400B general permits. These permits allow and regulate the discharge of wineries and food processing facilities' process wastewater by land irrigation or drainfield. These permits prohibit direct discharge of this process wastewater to waters of the state. This permit evaluation report explains the proposed permits' conditions.

General permits are developed to cover minor discharges that have similar processes and would not adversely affect waters of the state if they meet the conditions of the permit. The permit also authorizes permit holders to recycle the process wastewater as irrigation water during the dry months of the year. Lastly, the permit allows permit holders to process, apply to land, transfer to another treatment facility, dispose of, or beneficially reuse process wastewater solids.

Oregon Administrative Rules (OAR) 340-045-0040 state that facilities submitting a complete renewal application before the permit's expiration date can continue to operate under the terms and conditions of the expired permit until DEQ takes final action on the renewal application.

Oregon Revised Statutes (ORS 468B.050), require a National Pollutant Discharge Elimination System (NPDES) or a WPCF permit to construct install, modify or operate any process wastewater reuse system that applies the effluent to the environment. This proposed permit action by DEQ complies with both federal and state requirements.

2.0 Permit History

2.1 Issuance, Renewal and Modifications

DEQ originally issued the 1400 General WPCF permit in 1988 to allow small seasonal food processors and wineries to beneficially reuse or dispose on-site, process wastewater in quantities not-to-exceed 25,000 gallons per day. These permits have been modified and renewed over the years. The current 1400 Permits expired on October 31, 2017. These proposed permit renewals include changes and modifications to align the permit conditions with current research and legislative requirements.

3.0 Permit Discussion

3.1 Permit Coverage

Sources and permitted activities. The cover pages describe the sources of process wastewater and scope of activities allowed by these permits. These permits allow the construction, installation, and operation of a process wastewater reuse (and disposal system for 1400B permit holders) that meets the following criteria:

1400A

- Wineries and seasonal fresh pack operations or other operators washing fruits, vegetables, or nuts that do not significantly alter its product from its original state by cooking, pickling, slaughtering, or other mechanical, chemical or thermal processes and,
- Generates less than 82,000 gallons per day of process wastewater.

1400B

- Any winery, seasonal fresh pack operation, and food processor or other operators washing fruits, vegetables, or nuts that alters the original state of the product by cooking, pickling, slaughtering, or other mechanical, chemical or thermal processes and,
- Generates less than 82,000 gallons per day of process wastewater.

No discharge to waters of the state, including surface water or groundwater, is allowed unless specifically authorized under another permit issued by DEQ.

3.2 Evaporative pond

The original 1400A general permit did not allow discharge to an evaporative pond. This current version allows 1400A and 1400B permittees to discharge process wastewater to an evaporative pond provided the pond is lined to ensure the process wastewater cannot leach or penetrate beyond the pond's boundaries and reach waters of the state. In addition these ponds must be managed to prevent the development of nuisance conditions such as creating noxious odors, attracting rodents, or providing breeding habitat for mosquitos, flies or other vectors.

3.3 Permitted process wastewater discharge volume

The original 1400 general permits restricted permittees to a maximum daily production of process wastewater to 25,000 gallons. Facilities that exceeded this volume were required to obtain an individual permit. After receiving stakeholder comments, DEQ's technical team reviewed this maximum discharge limit and determined that 82,000 gallons per day is an appropriate upper limit for this permit provided the facility remains in compliance with the rest of the permit conditions. This was based on the volume of water necessary to irrigate one acre of land with three inches of water. Permit holders of the 1400 general permits predominantly have more than one acre of land needing irrigation. With this increase more facilities could be covered by these permits and the process wastewater could be beneficially utilized on the permitted facility's property.

3.4 De minimis Activities

Mobile slaughtering process is identified as a de minimis activity. The Oregon Department of Agriculture defines "Mobile custom slaughtering establishment" in OAR 603.028-0600 as a custom slaughtering establishment consisting of a truck, trailer, or other vehicle, and the equipment and utensils situated therein or thereon. Even though slaughtering produces a high strength waste stream (high in Biochemical Oxygen Demand, sodium, nitrogen, etc.), these facilities produce a low volume of process wastewater to be discharged (typically less than three gallons per animal butchered) and the frequency of these activities on any given property are predominantly limited to one or two events in a given calendar year. Because the volume of process wastewater is low and they are infrequent there is a low potential for these activities to adversely affect the environment or create nuisance conditions.

Food processing facilities can produce a process wastewater with concentrations of contaminants that could adversely affect the environment if the process wastewater is discharged in large volumes. Based on the concentrations commonly found in these waste streams (summarized in Table 1) DEQ has determined facilities that produce less than 100 gallons of process wastewater per day have a low potential to adversely affect the environment provided the process wastewater is properly managed and discharged over a large enough area that the process wastewater does not run off site, pond up, or create nuisance conditions.

For this round of the permits, DEQ has identified wineries that produce less than 6,000 cases of wine per year as de minimis facilities provided they properly manage their wastewater. This production volume was identified as the limit for de minimis exemption based on comments received from stakeholders and current literature. In summary, the wine industry has four main seasons: harvest and crush, fermentation, racking, and bottling. The harvest and crush season typically starts in late summer to early fall and continues for about two months. This is the period when the winery produces approximately 50% of its total volume of wastewater. The wine industry has identified an average winery of this size discharges approximately six gallons of wastewater for every gallon of wine produced. Using these estimates, a winery producing 6,000 cases (14,268 gallons) of wine produces approximately 86,000 gallons of wastewater a year of which it discharges approximately 43,000 gallons over approximately 60 days resulting in approximately 710 gallons of wastewater per day. The remaining 43,000 gallons is discharged over the rest of the year. This short duration of elevated flow (710 gallons per day) of winery wastewater followed by extended rest period provides the micro and macro organisms in the soil the opportunity to assimilate the beneficial constituents in the wastewater without overtaxing the native systems. The winegrower's association has lobbied for a higher de minimis limit, but DEQ has determined that exceeding the 710 gallons per day of winery wastewater discharged to a one half acre plot of grass has the potential of exceeding the soil's ability to assimilate the biochemical oxygen demand (BOD) load and the chloride concentration. Exceeding the BOD load to a plot of land can deplete the oxygen content of the soil. This oxygen depletion restricts the soil microorganisms' ability to decompose the organic matter creating anaerobic conditions. This manifests as malodors, stressed vegetation, and potential mobilization of contaminants leaching to groundwater. DEQ has agreed to identify wineries with production levels below 6,000 cases per year as de minimis provided they properly manage their wastewater. DEQ will re-evaluate this determination in the next permit cycle or when new information becomes available.

3.5 Application Instructions.

This section of the permit describes application requirements in OAR 340 Division 045 for new and continued permit coverage under these general permits. This includes:

- A completed permit application;
- A system design plan;
- An operations and maintenance manual;
- A site evaluation report for drainfield or site review for beneficial reuse;
- Permit fees

To apply for registration under these general permits, a person must submit to DEQ a complete permit application and permit fees. Permit fees are set in rule under OAR 340-045-0075 Table 70G General NPDES and WPCF Permits, which currently includes the following fees for a new application:

<u>1400 A General Permit</u>		<u>1400 B General Permit</u>	
New-permit application fee:	\$252	New-permit application fee:	\$402
First year annual fee:	\$336	First year annual fee:	\$574
Total	\$588	Total	\$976

An incomplete application will be returned to the applicant for completion. DEQ may request additional information necessary to evaluate the application. If the application materials are acceptable, DEQ will

send acknowledgment of registration under the permit. DEQ may inspect the process wastewater system for compliance with the permit during or after construction. The permit applicant is required to have and maintain an accurate and current Process Wastewater Management Plan documenting the process wastewater system design, operation, and maintenance as stated in Schedule D of these permits.

The 1400A and 1400B WPCF general permits will be valid for a period of up to 10 years. Any person registered under these permits and wishing to continue coverage is required to renew registration by submitting an application at least 30 days prior to expiration of these permits.

The applicant must send a permit application to the permit coordinator located in the appropriate DEQ regional office.

3.6 Definitions.

Definitions for terms and abbreviations that are used in this permit and specific to the 1400 general permits are provided in alphabetical order in the permits. These definitions were taken from state regulations and other established state permits.

State regulations define two types of industrial wastewater: process and non-process. Process wastewater is defined as any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, by-product, or waste product. Non-process wastewater includes wastewater discharged from non-contact cooling water, boiler blowdown, and air conditioning condensate. These permits were written to be protective of human health and the environment for the reuse and discharge of the process wastewater which predominantly contains higher concentrations of potential contaminants. As such the term “process wastewater” was used thorough out the permits to include both process wastewater and non-process wastewater.

3.7 Oregon Water Resources – Water Reuse

Facilities covered by one of these general permits and have a water right to obtain their water from groundwater sources, do not need to complete the Registration of Reclaimed Municipal Use form with the Oregon Water Resources Department (OWRD). In addition, the proposed process wastewater land application is exempt from needing its own water use permit for irrigating with the process wastewater (ORS 537.545(1)(g)(A) and ORS 537.141). Facilities that obtain their water from sources other than groundwater may be required to complete the OWRD Registration of Reclaimed Water Form.

3.8 Schedule A Permit limits

Oregon Revised Statue (ORS) 468B.015 establishes a public policy to encourage the appropriate reuse of water and wastes. ORS 468B.050 requires permits for process wastewater reuse and disposal systems to ensure the protection of public health, safety, and welfare; public water supplies; and waters of the state. DEQ is tasked with encouraging water reuse while protecting public health and the environment and has developed the following permit restrictions.

3.8.1 Hauled Waste Limitations

The process wastewater treatment systems that are normally found at facilities holding the 1400A or 1400B permit are designed to treat the process wastewater stream to a safe level for terrestrial application. These systems are not designed to adequately treat the additional waste load that can be

introduced from hauled waste. As such, these permits prohibit the permittee from accepting hauled wastes unless the facility requests and obtains written approval from DEQ.

The permittee is authorized to haul and dispose of their process wastewater or process wastewater solids at a DEQ permitted facility that has agreed to accept the material.

3.8.2 Process Wastewater Limitations

These permits authorize process wastewater to be land applied provided that it does not contain high concentrations of solvent, cleaners or other chemicals that may be detrimental to crop growth or the environment. The permit does not allow the disposal of bulk quantities of these chemicals. Utilization of sanitizers and cleaning chemicals under normal application result in relatively low concentrations of these chemical in the process wastewater.

These permits also prohibit the permittee from accepting process wastewater from other facilities as well as treating, reusing or discharging process wastewater that is not normally associated with the facility’s operations. Managing the process wastewater associated with other activities typically requires a higher level of treatment than what this permit identifies. For this reason these permits do not allow these waste discharges.

Permitted Waste Stream Characterization

Waste streams associated with these permits typically contain significant concentrations of biodegradable organic material, total suspended solids, salts, nitrogen, and other nutrients. Process wastewater originating from fresh pack facilities typically have the lowest concentrations of nutrients and other chemicals. Process wastewater originating from facilities that alter the food from its original state typically has higher BOD load, organic material and solids. In many of these processes, the process wastewater may also have wide variations of pH. A summary of the process wastewater most commonly addressed in these permits is presented in Table 1.

Table 1. Summary of process wastewater from selected facilities.

Parameter	Winery	Food Processing	Rendering Plant	Fresh Pack - Fruit
Reference	Napa Sanitation District, 2009	EPA, 2007	EPA, 2007	
Flow	1100 gal/ton grapes	25,000 Gal/day	7,500 Gal/day	34,200 Gal/day
BOD ₅ , mg/L	131 - 7,200	2,200 – 46,000	7,600	17.63
COD, mg/L	285 – 2,280			
TSS, mg/L	5 - 720	-1357 – 122,000	-2,248	16.14
NH ₃ -N, mg/L	0.8 – 4.8			
TKN, mg/L	1.0 – 12.4	740 – 1,500	740	
NO ₃ -N, mg/L	0.1 – 2.3			
Total-P, mg/L	0.3 – 2.5	8 - 53	183	
pH, S.U.	5.0 – 10.0			7.3
Chlorides, mg/L	10 – 5,000	50 - 460	1,700	46.1
Sodium, mg/L		15 - 135	818	

As indicated in Table 1, this process wastewater typically contains macronutrients such as nitrogen and phosphorus, as well as organic carbon and some micronutrients, such as boron. DEQ encourages reusing this water, as these compounds can be beneficial to agricultural practices, and the reuse of this water could reduce the demand for potable water. However, this process wastewater remains a potential source for the transmission of pollutants and can have an adverse effect on the environment if the wastewater is not properly managed. As such the reuse of this process wastewater is only authorized under conditions that minimize potential risks.

More than ninety five percent of the available freshwater in Oregon is in underground aquifers. Seventy percent of all Oregonians and more than ninety percent of rural Oregonians rely on groundwater as their primary or secondary drinking water source. Groundwater also supplies the base flow for the state's rivers and streams. DEQ is responsible for protecting Oregon's groundwater resources, and regulates process wastewater pollutant discharge to the land. DEQ has developed the reuse and discharge limitations in Schedule A to protect public health and the environment, with special consideration to protect Oregon's groundwater resources.

The "Land Application Limitations" under Schedule A of the proposed permit establish requirements for reusing process wastewater that allow beneficial reuse to occur while protecting public health and the environment.

3.9 Land Application Limitations

The proposed 1400A and 1400B general permit limits are included in Schedule A of the permits. These proposed limits have been established after reviewing independent research as well as state and federal law. Each of the limits in Schedule A and how they were established are discussed below.

3.9.1 No Discharge to Waters of the State

All process wastewater must be either discharged to a permitted sanitary sewer system, permitted discharge system, or collected and land applied at an agronomic rate to ensure the process wastewater is beneficially reused and not allowed to discharge off-site or adversely affect groundwater. The waste limits and review process for these permits were designed to limit potential adverse effects to the terrestrial environment, and do not meet the standards necessary to protect aquatic systems. For this reason, this permit does not allow the direct discharge of process wastewater to waters of the state.

3.9.2 Prohibition of Groundwater Degradation

Oregon regulations specify all groundwater of the state must be protected from pollution that could impair existing or potential beneficial uses (OAR 340-040-0020(3)). To ensure groundwater protection, the permit specifies process wastewater that is used for irrigation is to be applied at accepted irrigation and agronomic rates to prevent groundwater degradation.

Oregon State Extension services identify accepted agronomic rates, and publishes these rates in fertilizer guides. These rates are established by identifying the concentrations of nutrients needed for an optimum crop while minimizing the amount that passes below the root zone. These values vary depending on the region's climate, growing season, and crop. These fertilization guides can be found on the internet at: <https://catalog.extension.oregonstate.edu/topic/agriculture/fertilizer-guides>.

Irrigation rates are based on a specific field's soil moisture or the growing season's evapotranspiration rate which is determined by the water lost from surface evaporation (dependent on wind speed and

temperature) and water lost through plant tissue. Soil moisture can be determined by utilizing the US Department of Agriculture’s “Estimating Soil Moisture by Feel and Appearance” method (available on line at: https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_051845.pdf). Evapotranspiration rates for a permittee’s region can be obtained on the US Department of the Interior’s Bureau of Reclamation’s web page <https://www.usbr.gov/pn/agrimet/monthlyet.html>. These values indicate a rough estimate of the volume of water need for irrigation.

The permit also specifies the permanent groundwater must be at least four feet below ground surface and temporary groundwater must be at least two feet below ground surface at the time of irrigation. This restriction has been incorporated to allow any potential contaminants present in the process wastewater to be captured and bound in the soil matrix, or broken down to basic elemental components before the contaminants can reach the shallow aquifer.

3.9.3 Process Wastewater Irrigation Management

The proposed permits identify limits for process wastewater that is beneficially land applied and criteria for the land that will receive the process wastewater. This section presents the criteria used to identify property that is acceptable for land application. These criteria were developed from the selection process established in OAR 340-055, the recycled water regulations.

The 1400B permit has numeric process wastewater benchmarks. These benchmarks are presented in Table A1 of the 1400B permit and reproduced below. These constituents of concern have the potential to adversely affect groundwater quality. DEQ selected the benchmarks identified in Table A1 to ensure the beneficial land application of this water has no detrimental effect to land use, and meets groundwater quality objectives. Each of the process wastewater constituents of concern and their benchmarks are discussed below.

Table A1

Constituent	Units	Monthly Average Limits
Sodium Adsorption Ratio (SAR)		3
Electrical Conductivity (EC)	dS/m	2
Biochemical Oxygen Demand (BOD)	lbs./acre/day	100
pH	SU	6.0 – 8.5
Constituent	Units	Yearly Limit
Nitrogen	lbs./acre/yr.	100

3.9.3.1 Salinity

Salinity is a measure of dissolved salts in water. Excessive salinity in the process wastewater can adversely affect beneficial water uses. Sodium is one of the major inorganic fractions that constitute salinity among process wastewater. When process wastewater with high concentrations of sodium is applied to agricultural soil, the sodium can have a detrimental effect on the soil structure. High sodium concentrations can create soil swelling and break down clay particles, which then disperse and can clog soil pore spaces and induce a reduction of water infiltration, hydraulic conductivity and cause surface crusting. Very few crops can tolerate growing in high sodium concentrations. Most plants exposed to water with high sodium concentrations experience stunted root growth, reduced crop yield and wilting. To reduce the potential of degradation to a crop irrigated with process wastewater, this permit establishes benchmarks for salinity by using sodium adsorption ratio (SAR) and electrical conductivity.

Sodium Adsorption Ratio. The sodium adsorption ratio (SAR) is calculated from the concentrations of sodium, magnesium and calcium. Because sodium can cause dispersion of clay particles and calcium and magnesium can counteract this dispersion, the use of SAR as a benchmark takes into account some of the variability of salinity's effects on a field. For this permit the benchmark for SAR is 3.0¹. This benchmark is based on SAR identified in literature which is determined to have a low potential of causing adverse effects on agricultural crops and soil structure.

Electrical Conductivity. When a salt dissolves in water it breaks down into positively and negatively charged ions. These ions suspended in water conduct electricity. Electrical conductivity (EC) provides a means to measure the total salinity of a liquid with a simple meter. However, EC is affected by the presence of other constituents which may not affect the total alkalinity of the solution, and could result in the EC overstating a solution's salinity. EC is also affected by temperature, so it is stated at a standard of 25 °C. This permit establishes the benchmark for EC as 2 dS/m.² The benchmark is based on EC identified in literature which is identified as having a low potential of having an adverse effect on agricultural crops.

Facilities must test their process wastewater for SAR and EC to determine if the process wastewater can be safely land applied. Facilities with elevated SAR and EC will be required to explain in their wastewater management plan how they will mitigate the potential salinity issues. Facilities with SAR and EC levels below the analytical detection levels in their process wastewater may be able to discontinue monitoring for SAR and EC after the first year of sampling if approved by DEQ in writing.

3.9.3.2 Chloride

One of the major anions found in process wastewater is chloride. Chloride is an important element for plant health. It is commonly found in irrigation water and being negatively charged, it passes easily through the soil profile where it can become readily available for plant uptake. It is necessary for the process of opening and closing of stomata which control the plants' gas exchange. Chloride is essential for the functions in photosynthesis which enables the plant to grow and produce food. It functions in cation balance and transport within the plant, and chloride helps the plant fight off fungal infections. However, too much chloride can be toxic to the plants. It can cause scorching of leaf margins and stunt leaf size and overall plant growth. At high enough concentrations it can lead to defoliation and kill the crop. It is more likely to accumulate in older tissue than in newly matured leaves so trees and shrubs tend to have a lower tolerance to elevated concentrations. Some facilities (such as butchers or some food processors) will be required to monitor for sodium and chloride. These facilities will be notified of this requirement in their Notice of Coverage letter.

3.9.3.3 Biochemical Oxygen Demand

Organic material from decayed plant and animal residue, is a major contributor to increasing soil productivity and soil fertility. This is due to the organic material's ability to improve the soil's structure which makes the soil easier to work as well as increases the water holding capacity and water infiltration. It also increases the activity of micro and macro organisms. As the organic material decomposes, it releases nutrients for plant growth such as nitrogen, carbon, and phosphorus. Decomposition of organic matter also depletes soil oxygen, so too much organic material in the soil can reduce the oxygen content and create anaerobic conditions, which can reduce plant growth and water infiltration rates. Overloading the soil with organic matter may also adversely affect groundwater quality

¹ Water Quality for Agriculture, R.S. Ayers and D.W. Westcot, Food and Agriculture Organization of the United Nations - Irrigation and Drainage Paper No. 29, Rev. 1 1985

² Ibid

by lowering the oxidation/reduction potential in the soil, causing potential mobilization of naturally occurring inorganic constituents such as copper, iron and manganese. With proper management and the appropriate application of process wastewater, the soil can gain significant benefits while reducing the likelihood of detrimental effects.

Biochemical Oxygen Demand (BOD) represents the amount of dissolved oxygen that aerobic organisms need to break down the organic material present in the process wastewater. This permit establishes an effluent benchmark for BOD as the monthly average of 100 pounds per acre per day for land application³. This benchmark is based on literature values for BOD loading in land application systems for food processors. In a properly operated land application system, where the land application rates comply with these benchmarks, the irrigated field will benefit from the increased organic material without potential detrimental effects.

3.9.3.4 pH

The pH of water is a measurement of its acidity or alkalinity. It is based on the negative logarithm of the hydrogen-ion concentration, expressed as moles per liter and ranges on a scale from 0 (most acidic) to 14 (most alkaline). This measurement helps to determine the influences of irrigation water on crop production, availability of soil minerals, functioning of soil microorganisms, and the fate and transport of constituents in the irrigation water and in the soil. A neutral pH is 7. The ideal pH for most agricultural crops is slightly acidic, between 6.0 and 7.0, although some crops can tolerate more alkaline or acidic conditions. If the soil pH becomes too alkaline (pH>8.5), iron, manganese and other essential micronutrients are less available to plants. In contrast, if the soil pH is too low (pH< 4.20), these same micronutrients become more soluble and may leach from the soil at such concentrations that they can become toxic to plants, resulting in a failed crop. For this reason this permit establishes the benchmark for monthly average process wastewater pH for reuse as 6.0 to 8.5.

3.9.3.5 Nitrogen

Nitrogen (N) is one of the contaminants of concern found in food process wastewater. It is also a critical nutrient for plant growth that is most frequently deficient in agricultural soil. It is necessary for the formation of proteins and photosynthetic activity. Even though nitrogen is a primary component of our atmosphere, it is commonly not in a form that is readily available for plant use. Nitrogen is absorbed into plants as nitrate (NO₃⁻) and ammonium (NH₄⁺). Nitrate is the most plant available form of nitrogen in moist, well-aerated soils. Because it is negatively charged it is also the most susceptible to leaching quickly through the soil profile and can end up in groundwater. Sandy soil is generally more susceptible to nitrate leaching than soil with higher clay content. When nitrogen concentrations in soil is deficient, root systems and plant growth is stunted and leaves turn yellow. However, too much nitrogen can cause delayed plant maturity with excessive vegetative growth with reduced yield. High concentrations of nitrogen in the groundwater can create health hazards for humans and livestock. Excess nitrogen in surface water can overstimulate aquatic plants and algae growth which uses up the dissolved oxygen resulting in fish kills and destroys other aquatic life. As a result, nitrogen must be applied at appropriate rates which stimulate agricultural plant growth but not at detrimental levels.

Nitrogen concentrations can be managed in a number of ways, such as treatment of the process wastewater through settling/clarifying and/or denitrification. It can also be controlled by application of the process wastewater to a crop within the accepted agronomic range. The actual method of nitrogen control is left to the permitted facility and must be documented in their process wastewater management

³ Nuisance threshold, Pollution Abatement in the Fruit and Vegetable Industry, United States Environmental Protection Agency (USEPA Publication 625/3-77-0007)

plan discussed in Schedule A and the annual report as discussed in Schedule B. The application of process wastewater and/or process solids to a crop must be administered at an accepted agronomic rate that allows plant uptake of the nitrogen. Oregon State University Extension Service developed these agronomic rates, and publish them in fertilizer guides. These can be found on the internet at: <https://catalog.extension.oregonstate.edu/topic/agriculture/fertilizer-guides>. These fertilizer guides provide nutrient budget calculations, establishing the application practices for nitrogen that may be found in the process wastewater and/or process solids. These values are based on the nutrient need of the vegetation or crop being grown in the land application area. Crop nutrient application rates shall not exceed a site's ability to contain the nutrients through soil adsorption and plant uptake. For this reason the proposed permit identifies a benchmark of 100 pounds of nitrogen per acre per year from process wastewater. If a permittee finds the nutrients in the process wastewater and process solids exceed this benchmark, then the permittee must implement management practices that will prevent degradation of groundwater due to application of excess nutrients. Such practices may include obtaining access to additional land for nutrient application, or exporting the non-hazardous, decomposable processing solid waste to a DEQ permitted composting facility or DEQ permitted landfill. Facilities that wish to land apply nitrogen in excess of the 100 pounds of nitrogen per acre per year must explain why their nitrogen loading is appropriate for their conditions and how they will ensure the protection of shallow groundwater in their process wastewater management plan.

3.9.3.6 Subsurface discharge (1400B only)

The monitoring parameters and limits for subsurface disposal are presented in Table A2. These parameters and limits are based on the limits identified in OAR 340-071 for sand filters, recirculating gravel filters or any other type of approved on-site wastewater disposal systems.

3.9.3.7 Exceedance of strength limitations

DEQ realizes there are facilities that may not be able to meet the process wastewater benchmarks presented in this permit but can still be protective of the environment in their particular area or situation. If a facility cannot continuously meet these benchmarks but wishes to continue operating their existing system they must either contact DEQ and apply for an individual Water Pollution Control Structure (WPCF) permit or submit their process wastewater management plan which includes an explanation of how they will address the benchmark exceedances and ensure their activities are protective of human health and the environment.

3.9.3.8 Setbacks

Setbacks are established to create a buffer between the areas receiving recycled water and sensitive receptors. The setbacks identified in Table A1 of the 1400A permit and in Table A3 in the 1400B permit were developed from regulatory standards used in Oregon's recycled water regulations (OAR 340-055) and graywater regulations (OAR 340-053-0090) to be protective of surface water and groundwater. These setbacks are established to provide a minimum limitation. The permittee may increase these setback to ensure they stay in compliance with the permit and improve neighborly relations. These setback may also need to be increased to prevent the potential of overspray or off-site discharge due to high winds. If the irrigation area is located adjacent to potential sensitive receptors such as school grounds or endangered species habitat, it may be prudent for the permittee to increase the setbacks to reduce the risk of permit violations.

3.9.3.9 Crossing Property lines

Process wastewater can be reused for beneficial purposes within the tax lot in which it was created, provided the facility follows all permit provisions. The facility may also use this process wastewater on adjacent tax lots, provided the permittee follows all permit conditions, and the permittee has a written agreement with the property owner on which the process wastewater is beneficially used. The permittee must keep this written agreement current, and ensure the property owner receiving the process wastewater knows the water's origin, and understands and conforms to all permit conditions. This written agreement must also authorize DEQ personnel access to the land application area.

3.9.3.10 Separation of sanitary waste and process wastewater

The discharge of sanitary waste requires a more complex treatment system than this permit covers to protect human and environmental health. For this reason this permit prohibits mixing sanitary waste with process wastewater, used for beneficial land application.

Small volumes of graywater produced in association of the facilities activities may be mixed with the process wastewater and beneficially reused (and/or disposal for 1400 B permit holders). This allowance has been added to permit facilities to discharge process wastewater from utility sinks, used for cleaning small equipment and handwashing, with the rest of the process wastewater. These sinks are frequently located inside or directly adjacent to the processing structure(s).

3.9.3.11 Waste Solids Management

The solids that accumulate from the facility's process wastewater can be managed in three different ways. Permitted facilities can use any combination of these three methods.

The first option, consists of using the solids as a fertilizer or soil amendment provided it is applied at an appropriate agronomic rate. This requires laboratory analysis of the solids to determine the nutrient concentrations (predominantly nitrogen). Once a facility knows the nutrient concentrations of their waste solids, concentration values are compared to the Oregon State University's fertilizer guides available on line at: <https://catalog.extension.oregonstate.edu/topic/agriculture/fertilizer-guides> to determine the number of acres needed to spread the volume of solids produced by the facility. This is determined to be the appropriate agronomic rate and is used to ensure a facility is not over applying nitrogen to the soil. Over application of nitrogen can result in nitrogen leaching deeper into the soil profile, below the crops roots, and contaminate the area's groundwater. A facility can also compost the solids to produce a more stable soil amendment.

The second option is using the solids as a feed for livestock. This is authorized provided the solids are stored in such a manner as to ensure no leachate enters waters of the state or create nuisance conditions such as fly and mosquito breeding or attract rodents and other vectors.

The final option is the disposal of the solids at a DEQ-permitted solid waste landfill.

3.9.3.12 Process Wastewater storage

This permit authorizes the storage of process wastewater before land application. Depending on the proposed storage structure, additional engineer design review, permits, or licenses may be necessary from county (such as zoning approval), state (such as Oregon Water Resources), and/or federal agencies (such as US Army Corp). Open storage structures such as lagoons, ponds or open tanks may require additional management activities such as odor minimization or other activities to prevent nuisance conditions such as fly and mosquito breeding, or attracting other vectors. This would include short residence times, active aeration, or other means to reduce noxious odors or attracting vectors. Ponds and

lagoons may need to be lined to ensure groundwater protection and remove any hydraulic conductivity to waters of the state.

3.9.3.13 Plan Review

To ensure facilities are properly designed to address the waste load anticipated for each waste stream, and to ensure the designed system will provide the appropriate protection of the environment and public health, DEQ must review and approve all facility plans before construction, as required in OAR 340-052.

3.9.3.14 Groundwater Monitoring

To ensure the protection of groundwater quality DEQ may require the permittee to conduct groundwater monitoring and/or apply for an individual permit if it becomes apparent the facility's activities could be adversely affecting the water quality in the aquifer.

3.10 Schedule B – Minimum Monitoring and Reporting Requirements

Schedule B describes the minimum monitoring and reporting necessary to demonstrate permit compliance. The authority to require periodic reporting by permittees is included in ORS 468.065(5). Self-monitoring requirements are the primary means of ensuring that the facility is meeting permit limits. The permittee may also need to monitor other parameters when insufficient data exist to establish a limit, but where there is a potential for environmental concern. The minimum monitoring and reporting protocols for the permit include the following:

- a. Process wastewater monitoring and reporting requirements
- b. Monitoring Reduction
- c. Additional Monitoring

Table B1: Effluent Monitoring (for 1400B permits only)

Table B1 summarizes the parameters to be monitored on a regular basis in the effluent, along with associated monitoring frequencies and sample types.

Table B2 identify the monitoring requirements for subsurface disposal systems. These standards were based off of the standards established for the On-Site program in OAR 340-071.

3.10.1 Process Wastewater Monitoring and Reporting

The permittee must submit annual monitoring reports to DEQ by February 15th of each year. The required information that is to be provided in this annual report are detailed in this section of the permit. This information has been determined to be the minimum information needed to ensure permit compliance.

3.10.2 Monitoring Reduction (for 1400B permits only)

Because this permit covers such a wide variety of facilities across a very diverse geographic area, DEQ realizes some of the monitoring requirements established in this permit may not be necessary for all facilities in all areas for the full duration of this permit. As such, the proposed permit provides the process in which a facility may be able to reduce the required monitoring. The permit also addresses conditions that would cause DEQ to revoke the monitoring reduction.

3.10.3 Additional Monitoring (for 1400B permits only)

As noted above, this permit covers multiple types of facilities in a wide variety of locations and some additional monitoring that is not specifically called out in this permit may be required to ensure protection of human health and the environment. For this reason DEQ may identify additional monitoring requirements for facilities that were not originally anticipated during permit development. DEQ will notify in writing any facility that needs additional monitoring.

3.11 Schedule C, Compliance Schedules and Conditions

The Clean Water Act requires that state-issued permits are protective of human and ecological health. Sometimes a permittee cannot immediately comply with newly applied permit requirements upon the effective date of the permit because the permittee needs time to perform the tasks being required. Depending upon the circumstances, permits may include a series of required steps and deadlines (i.e., a compliance schedule), which upon completion, enables the permittee to meet the permit's requirements (see 40 CFR § 122.47 and OAR. 340-041-0061(16)).

The requirement to meet discharge limits will take time and resources for some facilities. As such a compliance schedule has been established to ensure appropriate actions are taking place at a rate that the facilities can achieve. This schedule provides twelve months for existing facilities to implement the appropriate measures needed to meet the new permit discharge limits.

3.12 Schedule D - Special Conditions

3.12.1.1 Process Wastewater Management Plan

This permit requires the permittee to develop and implement a Process Wastewater Management Plan. This plan is required to contain at a minimum:

- a. A flow diagram of all process wastewater collection and disposal systems;
- b. Process wastewater volumes in gallons per day;
- c. Process wastewater characterization such as biochemical oxygen demand (BOD), total nitrogen, and pH;
- d. The months that the land application of process wastewater will occur;
- e. A map or figure of the facility indicating application areas for liquids and/or solids, depicting the location of any surface water, wells, ditches, and neighboring structures;
- f. A description of the soil and acreage of the land application location;
- g. A description of any waste solids to be generated from the facility's process and the process wastewater control facility and how they will be used or disposed;
- h. A description of any chemical additives used in the product or process, that could become part of the process wastewater;
- i. A description of process wastewater discharge holding ponds or lagoons;
- j. A description of the irrigation system; including season start-up and shut down procedures;
- k. A description of how the system will be decommissioned should the facility ever terminate activities at this site.

This plan is to be maintained and updated as systems or processes change at the facility. A copy of this plan must be made available upon request. If the facility is found to be adversely affecting the area's groundwater quality, DEQ may require revisions or significant modifications to the system and plan.

Facilities that exceed the benchmarks identified in Table A1 of the 1400B permit must include in their process wastewater management plan detailed explanation of how the wastewater can be beneficially reused or discharged to a subsurface discharge system without degrading the environment or causing public health concerns. This includes a discussion of how the facility will ensure the proposed activities will be protective of the environment and public health, which may include additional sampling. This expanded process wastewater management plan must be submitted to DEQ for approval. DEQ will review and approve the wastewater management plan in writing before the facility may discharge any wastewater. Once the wastewater management plan is approved, the conditions in the plan will become enforceable permit conditions. Any changes to this plan must be approved in writing by DEQ before the modifications are made.

3.12.2 Subsurface Drainfield

If the permittee decides to address some of the process wastewater flow by using a subsurface drain field, the drainfield must be in compliance with DEQ's rules for on-site systems. This requires a site evaluation report which indicates the site conditions are appropriate for the type and quantity of waste to be disposed. This would include plans and specifications for the onsite system proposed for installation, the site layout, soil profile, depth to groundwater, location of any nearby structures and surface water, and any other information DEQ determines is necessary to complete the permit application.

3.12.3 Irrigation Site Evaluation

The location that is intended to receive process wastewater irrigation must be evaluated. The permit identifies the minimum requirements of this evaluation and the documentation requirements of this activity. This is necessary to ensure the permittee has taken the steps required to become familiar with the application site and confirm that the selected field(s) is appropriate for the proposed irrigation activities.

3.12.4 Revocation

Oregon DEQ may revoke any permit that is deemed to pose a threat to the environment or public health. The proposed permit provides the main conditions DEQ uses in determining if a permit should be revoked.

3.12.5 Reference Sources

Links to the Oregon State University fertilizer guides and DEQ's Guidelines for Land Application of Industrial Wastewaters are included below to provide access to additional resources and guidance documents should questions or issues arise.

Oregon State University, Fertilizer Guides

<http://extension.oregonstate.edu/catalog/details.php?sortnum=0134&name=Fertilizer+Guides&sort=title>
[a](#)

DEQ, Guidelines for Land Application of Industrial Wastewaters, 1992

<http://www.deq.state.or.us/WQ/pubs/guides/landapplindww.pdf>

3.13 Schedule F - WPCF General Conditions

These conditions are standard to all WPCF permits and address state statutes and rules pertaining to all types of system operations that do not discharge directly to surface waters. The General Conditions were revised in 2010. A summary of the changes is as follows:

- Reporting requirements regarding overflows have been made more explicit.
- Requirements regarding emergency response and public notification plans have been made more explicit.

4.0 Next Steps

4.1 Public Comment Period

The proposed permits will be made available for public comment for 35 days. Public notice and links to the proposed permit will be posted on DEQ's website, and sent to existing permit holders as well as subscribers to DEQ's pertinent public notice e-mail lists. A Public Hearing will be scheduled if requested by 10 or more people, or by an authorized person representing an organization of at least 10 people. If a public hearing is to be held, then an additional public notice would be published to advertise the public hearing.

4.2 Response to Comments

DEQ will respond to comments received during the comment period. All those providing comment will receive a copy of DEQ's response. Interested parties may also request a copy of DEQ's response. Once comments are received and evaluated, DEQ will decide whether to issue the permits as proposed or to make changes to the permits. DEQ will notify the permittees of DEQ's decision.

4.3 Modifications to Permit Evaluation Report and Fact Sheet

Depending on the nature of the comments and any changes made to the permits resulting from the comments, DEQ may modify this permit evaluation report and fact sheet. DEQ may also choose to update the permit evaluation report and fact sheet through memorandum or addendum. If substantive changes are made to the permits, then an additional round of public comment may occur.

4.4 Issuance

The DEQ mails the finalized, signed permit to the permittees who have paid the appropriate fees and submitted an accepted application form.

5.0 References

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Winewatch Fact Sheet1, Winery Wastewater Management by Small Wineries.

<https://www.wineaustralia.com/getmedia/b10d60d0-b879-4e11-b967-0c8d6bbacb72/Small-wineries-WA.pdf>, Australia, accessed March, 2018.